

CLAIM AMENDMENTS

1. (Currently Amended) A composition comprising:
a) an electrode comprising:
 i) a self assembled monolayer comprising conductive oligomers; and
 ii) a capture probe;
b) a target nucleic acid sequence comprising a first portion that is capable of hybridizing to said capture probe, and a second portion that does not hybridize to said capture probe and comprises at least one covalently attached electron transfer moiety (ETM).

2. (Currently Amended) A composition comprising:
a) an electrode comprising:
 i) a self assembled monolayer comprising conductive oligomers; and
 ii) a capture probe;
b) a label nucleic acid probe comprising a first portion that is capable of hybridizing to a component of an assay complex, and a second portion comprising a recruitment linker that
 i) does not hybridize to a component of assay complex; and
 ii) comprises at least one covalently attached electron transfer moiety (ETM).

Claims 3-10: (Canceled)

11. (Currently Amended) A method of detecting a target nucleic acid sequence in a test sample comprising:
a) forming a hybridization complex including said target sequence and a capture probe; wherein said capture probe is on an electrode comprising a self assembled monolayer comprising conductive oligomers;
b) directly or indirectly attaching at least one label probe to said target sequence to form an assay complex, wherein said label probe comprises a first portion capable of hybridizing to a component of said assay complex, and a second portion comprising a recruitment linker that
 i) does not hybridize to a component of said assay complex; and
 ii) comprises at least one covalently attached electron transfer moiety (ETM); and
c) detecting the presence of said ETM using said electrode.

Claims 12-13: (Canceled)

14. (Original) A method according to claim 11 wherein said target sequence is attached to said electrode by hybridizing a first portion of said target sequence to a first capture extender probe, and hybridizing a second portion of said first capture extender probe to a capture probe on the electrode.

Claims 15-22: (Canceled)

23. (Currently Amended) A composition comprising:

a) an electrode comprising:

- i) a self assembled monolayer; and
- ii) a capture probe;

b) a target nucleic acid sequence comprising a first portion that is capable of hybridizing to said capture probe, and a second portion that does not hybridize to said capture probe and comprises at least one covalently attached electron transfer moiety (ETM).

24. (Currently Amended) A composition comprising:

a) an electrode comprising:

- i) a self assembled monolayer; and
- ii) a capture probe;

b) a label nucleic acid probe comprising a first portion that is capable of hybridizing to a component of an assay complex, and a second portion comprising a recruitment linker that

- i) does not hybridize to a component of assay complex; and
- ii) comprises at least one covalently attached electron transfer moiety (ETM).

25. (Currently Amended) A method of detecting a target nucleic acid sequence in a test sample comprising:

- a) forming a hybridization complex including said target sequence and a capture probe; wherein said capture probe is on an electrode comprising a self-assembled monolayer;
- b) directly or indirectly attaching at least one label probe to said target sequence to form an assay complex, wherein said label probe comprises a first portion capable of hybridizing to a

component of said assay complex, and a second portion comprising a recruitment linker that

- i) does not hybridize to a component of said assay complex; and
 - ii) comprises at least one covalently attached electron transfer moiety (ETM); and
- c) detecting the presence of said ETM using said electrode.

26. (New) A composition according to claims 1, 2, 23, or 24 wherein said ETM is ferrocene.
27. (New) A composition according to claim 1, 2, 23, or 24 wherein said label probe comprises a plurality of ETMs.
28. (New) A composition according to claim 1, 2, 23, or 24 wherein said first portion of said label probe further comprises a covalently attached ETM.
29. (New) A composition according to claim 1, 2, 23, or 24 wherein said assay complex comprises an amplifier probe.
30. (New) A composition according to claim 1, 2, 23, or 24 wherein said assay complex comprises a capture extender probe.
31. (New) A composition according to claim 1, 2, 23, or 24 wherein said monolayer further comprises insulators.
32. (New) A composition according to claim 1, 2, 23, or 24 wherein said capture probe is attached to said electrode via a conductive oligomer.
33. (New) A composition according to claim 1, 2, 23, or 24 wherein said capture probe is attached to said electrode via an insulator.
34. (New) A method according to claim 11 or 25 wherein said label probe comprises a plurality of ETMs.
35. (New) A method according to claim 11 or 25 wherein said target [sequence] sequence is attached to said electrode by hybridization to a capture probe.

36. (New) A method according to claim 11 or 25 wherein said target sequence is attached to said electrode by

- a) hybridizing a first portion of said target sequence to a first portion of a first capture extender probe;
- b) hybridizing a second portion of said first capture extender probe to a first portion of an capture probe on the electrode;
- c) hybridizing a second portion of said target sequence to a first portion of a second capture extender probe; and
- d) hybridizing a second portion of said second capture extender probe to a second portion of said capture probe.

37. (New) A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by hybridizing said first portion of said label probe to a first portion of said target sequence.

38. (New) A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by

- a) hybridizing a first portion of an amplifier probe to a first portion of said target sequence; and
- b) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

39. (New) A method according to claim 11 or 25 wherein said label probe is attached to said target sequence by

- a) hybridizing a first portion of a first label extender probe to a first portion of a target sequence;
- b) hybridizing a second portion of said first label extender probe to a first portion of an amplifier probe;
- c) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

40. (New) A method according to claim 11 or 25 wherein said label probe is attached to

said target sequence by

- a) hybridizing a first portion of a first label extender probe to a first portion of a target sequence;
- b) hybridizing a second portion of said first label extender probe to a first portion of an amplifier probe;
- c) hybridizing a first portion of a second label extender probe to a second portion of a target sequence;
- d) hybridizing a second portion of said second label extender probe to a first portion of an amplifier probe;
- e) hybridizing at least one amplification sequence of said amplifier probe to said first portion of at least one label probe.

41. (New) A composition according to claim 1, 2, 23, or 24 wherein said second portion is not nucleic acid.

42. (New) A composition according to claim 41 wherein said second portion is a metallocene polymer.

43. (New) A composition according to claim 42 wherein said metallocene polymer is a ferrocene polymer.